Pinnacle GeoSciences

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February 5, 2002

Proposal
Monitoring and Sparge Test Wells Installation, and Ground Water Monitoring
Time Oil Co. Property No. 01-063
618 East Toppenish Avenue
Toppenish, Washington

Time Oil Co.
2737 West Commodore Way
Seattle, Washington 98199-1233

Attention: Ms. Anastasia Wilkinson

1.0 INTRODUCTION

This submittal transmits our proposal for installing seven monitoring wells and one sparge test well at the site of Time Oil Co.'s Property No. 01-063. The site is located at 618 East Toppenish Avenue in Toppenish, Washington. The site is within the boundaries of the Yakama Indian Reservation

The property is occupied by a convenience store and formerly also had retail gasoline dispensing facilities including three steel USTs (underground storage tanks) with capacities of 12,000, 8,000 and 4,000 gallons. The UST systems were decommissioned and removed by TOC (Time Oil Co.) in October 2001. A representative of Pinnacle GeoSciences observed the decommissioning of the UST systems and provided a draft report of those activities to TOC titled ***Summary Report; Underground Storage Tank Removal Oversight*** dated January 3, 2002.

Field screening and laboratory testing indicated that gasoline-related soil contamination at concentrations in excess of the MTCA Method A Cleanup Levels for Unrestricted Land Use was present around the USTs and in the base of the excavation completed for the removal of the USTs. The contaminated soil was located in direct contact with ground water.

Minor surficial soil contamination was observed in the areas of the two dispenser islands, and was successfully removed.

We recommended in our ***Summary Report; Underground Storage Tank Removal Oversight*** dated January 3, 2002 that monitoring wells be installed at the sight to evaluate the limits of previously documented soil contamination, to evaluate for the presence of ground water contamination, and to install the wells necessary for performing a dual-phase extraction pilot test or an air sparging pilot test. We recommend that the decision as to which in-situ remediation

technology to perform a pilot test on be left until after the wells have been installed and ground water testing data is available.

The purpose of the scope of work presented in this proposal is to install seven ground water monitoring wells in the shallow saturated zone to evaluate ground water contaminant conditions and potentially be used for a dual-phase extraction pilot test; and to install one deeper well and three piezometers to test the feasibility of the use of air sparging as a treatment method. Based on the results of the soil and ground water assessment, we will make recommendations in a separate proposal pertaining to treatment system pilot testing.

Our specific scope of services for accomplishing these recommendations, in addition to four quarters of ground water monitoring, is presented in the following section.

2.0 SCOPE

The purpose of the scope of work detailed below is to perform additional soil assessment, ground water assessment and monitoring, and install the wells necessary for performing either dual-phase extraction or air sparging pilot tests at the site of Time Oil Co. Property No. 01-63 in support of the recommendations made in the previous section. The proposed scope of work is divided into three tasks for budgeting purposes. The task numbers in the scope do not correspond with the budgeting task numbers, which are provided for reference. Our proposed scope of work is as follows:

2.1 TASK 1 - MONITORING WELL INSTALLATION (BUDGETING TASKS 210 AND 220)

1. Perform a public utility locate through the one-call system and a private locate. The private locate will be performed by Cascade Northwest, Inc. (storm drains and sanitary sewer) and Applied Professional Services, Inc. (metallic utilities).
2. Drill seven monitoring well borings at the approximate locations shown in the attached figure. These wells will extend to a depth of 20 feet bgs. The borings will be drilled using 5.875-inch inner diameter hollow-stem auger equipment owned and operated by Holt Drilling, Inc. Soil samples will be obtained at 5-foot intervals from the borings. Drill cuttings will be stored on site in labeled drums pending laboratory testing.
3. Install a four-inch diameter monitoring well in each of the borings. The wells will be screened from 5 to 20 feet bgs. Well construction will be in conformance with Washington State regulations. The well heads will each be protected by a flush-grade steel monument set in concrete.
4. Field screen all soil samples obtained in item 3. using headspace and sheen screening methodology. Based on the results of field screening, submit one to two samples from each boring for laboratory testing of gasoline-range organics by Ecology Method NWTPH-G; BTEX by EPA Method 8021B; and total lead by EPA Method 6010. Selected soil samples may also be tested for EDB (ethylene dibromide) by EPA Method 8021B, EDC

(1,2 dichloroethane) by EPA Method 8021B, and MTBE (methyl tertiary-butyl ether) by EPA Method 8021B.

5. Survey the casing rim elevations of the seven new wells with respect to a benchmark to be established at the site.

6. Develop the new wells by bailing or pumping a minimum of five well volumes from each. Development water will be stored on-site in 55-gallon drums pending chemical testing.

7. Measure the depth to water in each of the wells, and calculate ground water elevations and ground water flow direction based on the depth to water data.

2.2 TASK 2 - SPARGE TEST WELL AND PIEZOMETER INSTALLATION (BUDGETING TASKS 310 AND 320)

8. Drill one sparge test well boring. This well will be located in native soil immediately outside of the former UST excavation on either the north, west or south side of the former excavation. The specific location will depend on the ground water flow direction obtained after the installation of the monitoring wells. The well will extend to a depth of approximately 20 feet bgs. The boring will be drilled using 4.25-inch inner diameter hollow-stem auger equipment owned and operated by Holt Drilling, Inc. Soil samples will be obtained at 1.5-foot intervals from the boring. Drill cuttings will be stored on site in labeled drums pending laboratory testing.

9. Install a two-inch diameter sparge well in the boring. The well will probably be screened from 18 to 20 feet bgs. The specific location of the screen will be determined based on soil conditions observed in the samples. The sand pack will extend one foot above the top of the screen. Bentonite pellets will be used to seal the boring from the top of the sand pack to the depth at which ground water is present, and bentonite chips will be used to seal the remainder of the boring.

10. Drill three borings to depths of 15 feet bgs. Install a one-inch diameter piezometer with a two-foot section of screen in each boring. The piezometers will be located 5, 12 and 25 feet away from the air sparge well. These piezometers will be used to measure saturated zone pressure during a future air sparging test to help evaluate the area of air sparging influence. Drill cuttings will be stored on site in labeled drums pending laboratory testing.

11. Survey the casing rim elevation of the air sparging well with respect to a benchmark established at the site.

12. Develop the air sparging well by bailing or pumping a minimum of five well volumes. Development water will be stored on-site in 55-gallon drums pending chemical testing.

2.3 TASK 3 - QUARTERLY GROUND WATER MONITORING (BUDGETING TASKS 410 AND 420)

13. Obtain initial ground water samples from the seven new monitoring wells at least one day after they are installed and developed. Three well volumes of water will be purged from

each well using a submersible pump before sampling. Purge water will be stored on-site in 55-gallon drums pending chemical testing. Each ground water sample will be obtained with a clean unused disposable bailer. Make three additional quarterly site visits to obtain ground water samples from the seven wells in a similar manner to that described above.

14. Submit the ground water samples obtained in the initial sampling event for laboratory testing of gasoline-range organics by Ecology Methods NWTPH-G, BTEX by EPA Method 8021B, total lead and dissolved lead by EPA Method 6010, EDB (ethylene dibromide) by EPA Method 8021B, EDC (1,2 dichloroethane) by EPA Method 8021B, and MTBE (methyl tertiary-butyl ether) by EPA Method 8021B. The dissolved lead samples will be field-filtered through a 0.45 micron filter. Submit the ground water samples from subsequent sampling events for laboratory testing of gasoline-range organics and BTEX. These samples will also be tested for EDB, EDC, MTBE, and total and dissolved lead if these contaminants are detected at concentrations that exceed the ground water cleanup levels in the initial samples.

2.4 TASK 4 - DEVELOPMENT AND PURGE WATER DISPOSAL, AND DRILL CUTTING DISPOSAL (BUDGETING TASK 510)

15. Treat the drummed well development and purge water as necessary using aeration equipment.
16. Obtain confirmatory water samples for analysis upon completion of treatment. Submit the samples for laboratory testing of gasoline-range hydrocarbons by Ecology Methods NWTPH-G and BTEX by EPA Method 8021B.
17. Discharge the treated water in accordance with Ecology guidance and policy, or in accordance with the EPA and Yakama Nation policy.
18. Arrange disposal of drill cuttings at a disposal location approved for petroleum-contaminated soil.

2.5 TASK 5 - REPORTING (BUDGETING TASK 230)

19. Provide written recommendations and a proposal for air sparging/vapor extraction or dual-phase extraction pilot testing based on the results of the well installation activities and initial ground water monitoring event.
20. Summarize the observations and results of the drilling activities and initial ground water sampling, including boring and well construction logs, and tabulated soil and ground water testing data, in a written report. The report will also include the results of the pilot testing and design recommendations for an in-situ treatment system. The report preparation budget presented in this proposal only includes costs for that portion of the report summarizing the drilling and ground water sampling. A budget for the pilot test analysis and reporting will be included in the pilot test proposal provided after the drilling is completed.

For TOC's budgeting purposes, we anticipate that a total of between eight and sixteen soil samples will be tested by Ecology Methods NWTPH-G, EPA Method 8021B, and total lead. Up to eight soil samples may also be tested for EDB, EDC and MTBE by EPA Method 8021B. Twenty-eight ground water samples and two development/purge water samples will be tested by Ecology Methods NWTPH-G and EPA Method 8021, total and dissolved lead, and EDB, EDC and MTBE.

4.0 CLOSING

Pinnacle GeoSciences appreciates the opportunity to provide this proposal for monitoring well installation and ground water sampling services. Please call if you have questions concerning this proposal.

Sincerely,
Pinnacle GeoSciences, Inc.

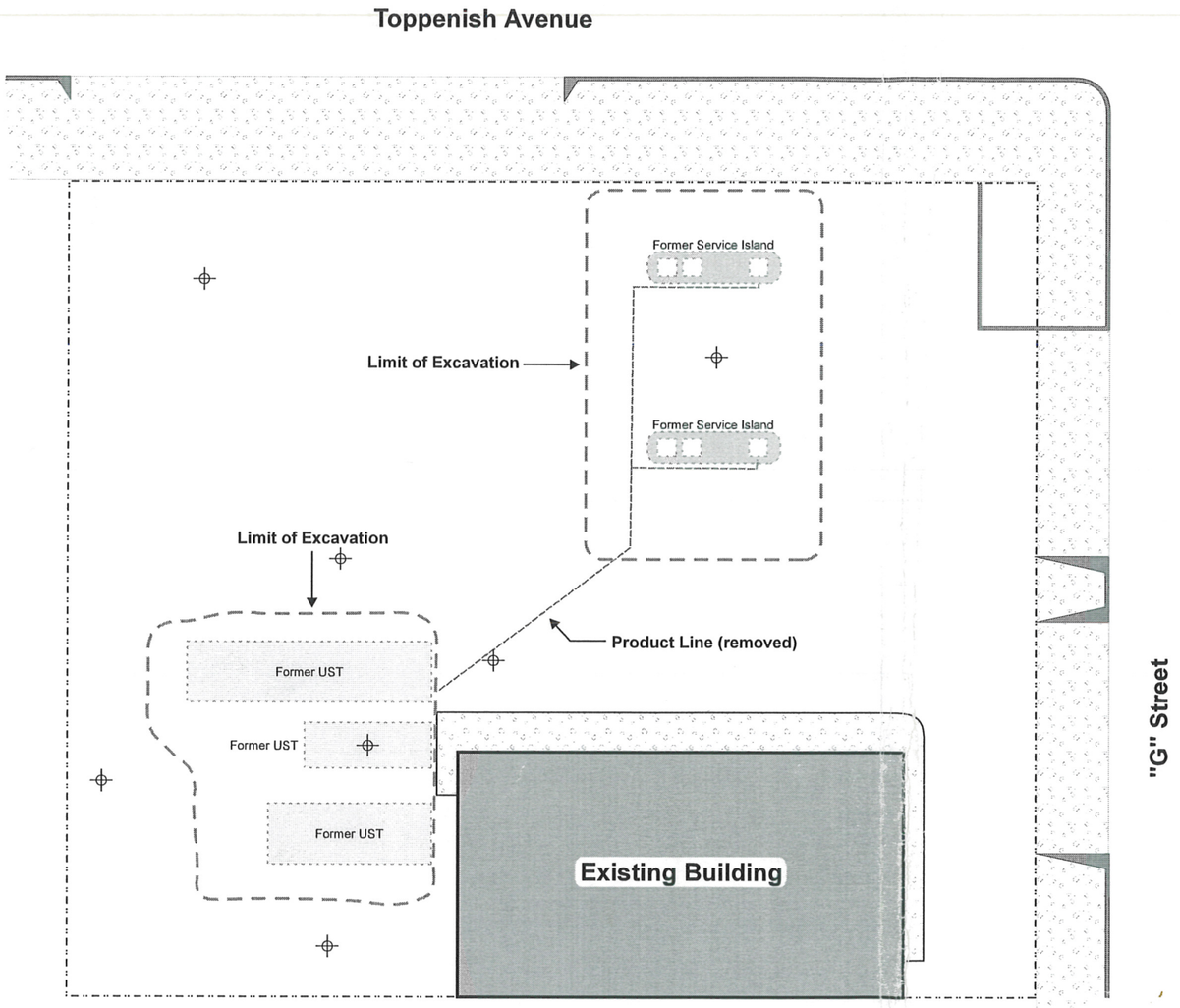
Norman L. Puri, P.E.
Senior Engineer

Stephen C. Perrigo
Principal

NLP:SCP

Attachments

2 copies submitted



Explanation

⊕ Proposed Monitoring Well Location

0 20 40 feet

Scale: 1 inch = 20 feet
Locations of All Features Shown Are Approximate

N

G.W.

Figure 3
Proposed Well Locations
UST Removal
Time Oil Co. Property 01-063
Toppenish, Washington
Pinnacle GeoSciences